

**We claim:**

1        1. A method for use in a system that is adapted to communicate  
2 a primitive data stream, the primitive data stream including a plurality of  
3 sub-streams, the method comprising the step of:

4                transmitting at least a portion of a processed sub-stream,  
5                the processed sub-stream representing one of the plurality of  
6 sub-streams,  
7                the processed sub-stream including a plurality of strata,  
8                each stratum of the processed sub-stream representing a  
9 respective sub-stream component of the one sub-stream.

1        2. The method of claim 1, wherein at a particular time the strata  
2 that comprise the processed sub-stream are concurrently applied to one  
3 transmit antenna.

1        3. The method of claim 1, wherein the transmitting step  
2 comprises transmitting the portion of the processed sub-stream from the  
3 start of a signal burst until the end of the signal burst.

1        4. The method of claim 1, wherein at least one transmit feature of  
2 said each stratum of the processed sub-stream is different from transmit  
3 features of the other strata of the processed sub-stream.

1        5. The method of claim 4, wherein the transmit feature is bit rate.

1        6. The method of claim 4, wherein the transmit feature is power  
2 level.

1        7. The method of claim 1, further comprising the steps of:

2            dividing the one sub-stream into plurality of sub-stream-  
3 components;

4            encoding and modulating each sub-stream component to obtain the  
5 strata of the processed sub-stream; and

6            combining the strata to form the processed sub-stream.

1        8. The method of claim 1, wherein the processed sub-stream

2 complies with a CDMA standard.

31        9. The method of claim 1, wherein the processed sub-stream

32 complies with a OFDM standard.

31        10. A method for use in a system that is adapted to communicate  
32 a primitive data stream, the primitive data stream including a plurality of  
33 sub-streams each including a respective plurality of sub-component data  
34 streams, the method comprising the step of:

35            transmitting at least a portion of each of a plurality of processed  
36 sub-streams,

7            each one of the processed sub-streams representing a  
8 respective one of the sub-streams,

9            each processed sub-stream including a plurality of strata,

10            each stratum of each processed sub-stream representing a  
11 respective one of the sub-stream-components of one of the component  
12 data streams represented by that processed sub-stream.

1        11. The method of claim 10, wherein:

2            the system is a multiple output system having at least two transmit  
3 antennas; and

4           at a particular point in time each of the processed sub-streams is  
5    applied to a respective one of the transmit antennas.

1           12. The method of claim 10, wherein:

2           the system is a multiple output system having at least two transmit  
3    antennas; and

4           the transmission of the processed sub-streams is started  
5    concurrently on the at least two transmit antennas.

1           13. The method of claim 10, wherein the transmitting step

2    comprises transmitting the portion of the processed sub-stream from the  
3    start of a signal burst until the end of the signal burst.

1           14. The method of claim 10, wherein at least one transmit feature

2    of said each stratum of one of the processed sub-streams is different from  
3    transmit features of the other strata of the one processed sub-stream.

1           15. The method of claim 14, wherein the transmit feature is bit

2    rate.

1           16. The method of claim 14, wherein the transmit feature is power

2    level.

1           17. The method of claim 10, further comprising the steps of:

2           dividing each sub-stream into the respective plurality of sub-stream-  
3    components;

4           encoding and modulating each sub-stream component to obtain the  
5    strata; and

6               combining the strata representing one of the pluralities of sub-  
7        stream-components to form one of the processed sub-streams.

1               18. The method of claim 1, wherein the processed sub-stream  
2        complies with a CDMA standard.

1               19. The method of claim 1, wherein the processed sub-stream  
2        complies with a OFDM standard.

1               20. A method for processing a received signal that includes at least  
2        a portion of at least one processed sub-stream, each processed sub-  
3        stream representing a respective one of a plurality of sub-streams, each  
4        sub-stream including a respective plurality of sub-stream-components,  
5        each processed sub-stream including a plurality of strata, each stratum of  
6        each processed sub-stream representing a respective one of the plurality  
7        of sub-stream-components of the particular sub-stream represented by  
8        that particular processed sub-stream, the method comprising the steps of:

9               (a) decoding at least a portion of one of the strata to obtain at least a  
10       portion of its respective sub-stream component;

11               (b) removing the decoded portion of the one stratum from the  
12       received signal; and

13               (c) decoding at least a portion of another of the strata to obtain at  
14       least a portion of its respective sub-stream component.

1               21. The method of claim 20, further comprising the steps of:

2               (d) removing the decoded portion of the other stratum from the  
3        received signal; and

4 (e) repeating decoding step (c) and removing step (d) until all of the  
5 sub-stream-components represented by the strata in the received signal  
6 are decoded.

1 22. The method of claim 20,

2 wherein:

3 the stratum decoded in decoding step (a) is portion of a first  
4 processed sub-stream;

5 the stratum decoded in decoding step (c) is portion of the first  
6 processed sub-stream after the decoded portion of the one stratum has  
7 been removed in step (b); and

8 the signal comprises at least two processed sub-streams; and

the method further comprising the steps of:

10 (f) decoding at least a portion of one of the strata that is part of  
11 another processed sub-stream;

12 (g) decoding at least a portion of another of the strata that is  
13 part of the other processed sub-stream.

1 23. The method of claim 22, wherein:

2 decoding step (f) occurs concurrently with decoding step (a); and  
3 decoding step (g) occurs concurrently with decoding step (c).

1           24. The method of claim 22, wherein decoding steps (f) and (g)  
2 occur after decoding step (c).

1 25. The method of claim 22, wherein:

2 at least one transmit feature of said each stratum of one of the  
3 processed sub-streams is different from transmit features of the other  
4 strata of the one processed sub-stream;

5        the transmit features of the stratum decoded in decoding step (a) are  
6        the same as the transmit features of the stratum decoded in decoding step  
7        (f); and

8        the transmit features of the stratum decoded in decoding step (c) are  
9        the same as the transmit features of the stratum decoded in decoding step  
10      (g).

1        26. The method of claim 20, wherein at least one transmit feature  
2        of said each stratum of one of the processed sub-streams is different from  
3        transmit features of the other strata of the one processed sub-stream.

1        27. The method of claim 26, wherein:  
2        the transmit feature comprises a bit rate;  
3        the stratum decoded in decoding step (a) having a bit rate that is  
4        lower than the bit rate of the other strata that are part of the same one of  
5        the processed sub-streams; and  
6        the stratum decoded in decoding step (c) having a higher bit rate  
7        than the bit rate of the stratum decoded in decoding step (a).

1        28. The method of claim 26, wherein:  
2        the transmit feature comprises a power level;  
3        the stratum decoded in decoding step (a) having a power level that is  
4        higher than the power level of the other strata that are part of the same  
5        one of the processed sub-streams; and  
6        the stratum decoded in decoding step (c) having a lower power level  
7        than the power level of the stratum decoded in decoding step (a).

1        29. The method of claim 20, wherein:

2        decoding step (a) comprises separating out and decoding the at least  
3        portion of the one stratum to obtain the at least portion of its respective  
4        sub-stream component;

5        removing step (b) comprises re-encoding the decoded respective sub-  
6        stream component to obtain the one stratum and subtracting the re-  
7        encoded one stratum from the received signal; and

8        decoding step (b) comprises separating out and decoding the at least  
9        portion of the other stratum to obtain the at least portion of its respective  
10        sub-stream component.

Q1        30. A transmitter for use in a system adapted to communicate at  
Q2        least a portion of a primitive data stream, the primitive data stream  
Q3        including a plurality of sub-streams, the transmitter comprising:

Q4        a first stratifier that stratifies one of the component data streams  
Q5        into a processed sub-stream,

Q6        the processed sub-stream component having a plurality of strata,

Q7        each stratum of the processed sub-stream representing a respective  
Q8        one of a plurality sub-stream component of the one sub-stream.

1        31. The transmitter of claim 30, wherein the first stratifier  
2        comprises:

3        a demultiplexer having an input that receives the one sub-stream  
4        and a plurality of outputs each for outputting one of the of sub-stream-  
5        components;

6        a plurality of encoder/modulators each having an input coupled to  
7        one of the outputs of the demultiplexer, each encoder/modulator encodes  
8        and modulates at least a respective one of the sub-stream-components to  
9        obtain its respective stratum; and

10        a combiner having a plurality of inputs each coupled to an output of  
11        one of the encoder/modulators and an output for outputting the  
12        processed sub-stream.

1        32. The transmitter of claim 31, wherein:

2        a bit rate of each stratum of the processed sub-stream is different  
3        from bit rates of the other strata of the processed sub-stream;  
4        the demultiplexer is a variable rate demultiplexer.

1        33. The transmitter of claim 31, wherein:

2        a power level of each stratum of the particular processed sub-stream  
3        is different from power levels of the other strata of the particular  
4        processed sub-stream; and

5        each of the encoder/modulators is operable to produce the strata  
6        such that the power level of each stratum of the particular processed sub-  
7        stream is different from the power levels of the other strata of the  
8        particular processed sub-stream.

1        34. The transmitter of claim 30, wherein the transmitter further  
2        comprises:

3        a primary signal demultiplexer having an input for receiving the  
4        primary signal and a plurality of outputs each for outputting one of the  
5        sub-streams;

6        a further plurality of stratifiers, each stratifier capable of stratifying  
7        at least one of the component data streams into a respective processed  
8        sub-stream, each stratum of one of the processed sub-streams  
9        representing a respective one of a plurality of sub-stream-components of  
10       the respective sub-stream of the one processed sub-stream.

1        35. The transmitter of claim 30, wherein at least one transmit  
2 feature of each stratum of the processed sub-stream is different from  
3 transmit features of the other strata of the processed sub-stream.

1        36. The transmitter of claim 30, wherein the transmitter is part of  
2 a base station of a wireless communication system.

1        37. The base station of claim 36, wherein the base station has a  
2 plurality of transmit antennas.

1        38. The transmitter of claim 30, wherein the transmitter is part of  
2 a terminal.

1        39. The wireless communication system of claim 36, wherein the  
2 wireless communication system is a CDMA system.

1        40. The wireless communication system of claim 36, wherein the  
2 wireless communication system is a OFDM system.

1        41. A receiver comprising:  
2            at least one receive antenna each receive antenna having an output  
3 for outputting a receive antenna signal, each receive antenna signal  
4 including at least a portion of at least one processed sub-stream, each  
5 processed sub-stream representing a respective sub-stream, each  
6 processed sub-stream including a plurality of strata, each stratum of each  
7 processed sub-stream representing a respective one of a plurality of sub-  
8 stream-components of the respective sub-streams of the processed sub-  
9 stream;

10 a processor having an input coupled to the outputs of the receive  
11 antennas, the processor adapted to:

12 obtain a receive signal from the receive antenna signals;

13 decode at least a portion of one of the strata to obtain at least  
14 a portion of its respective sub-stream component;

15 remove the decoded portion of the stratum from the receive  
16 signal; and

17 decode at least a portion of another of the strata to obtain at  
18 least a portion of its respective sub-stream component.

1 42. The receiver of claim 41, wherein the processor comprises a  
2 strata processor for decoding the stratum.

1 43. The receiver of claim 42, wherein the processor further  
2 comprises:

3 an encoder/modulator having an input coupled to the output of the  
4 strata processor, the encoder/modulator adapted for re-encoding the  
5 decoded sub-stream component to obtain its respective stratum; and

6 a combiner for subtracting any re-encoded stratum from the  
7 received signal.

1 44. The receiver of claim 41, wherein the processor is further  
2 adapted to:

3 remove the decoded portion of the other stratum from the receive  
4 signal; and

5 repeat the removing and the decoding of at least a portion of another  
6 stratum until all sub-stream-components represented by the strata in the  
7 received signal are decoded.

1        45. The receiver of claim 41, wherein processor is adapted to  
2 decode the strata of a first and a second processed sub-stream  
3 concurrently.

1        46. The receiver of claim 45, wherein:  
2            at least one transmit feature of each stratum of one processed sub-  
3 stream is different from transmit features of the other strata of the same  
4 one processed sub-stream;  
5            the strata decoded concurrently have the same transmit features.

1        47. The receiver of claim 41, wherein processor is adapted to  
2 decode the strata of a second processed sub-stream after decoding the  
3 strata of a first processed sub-stream.

1        48. The receiver of claim 41, wherein at least one transmit feature  
2 of each stratum of one processed sub-stream is different from transmit  
3 features of the other strata of the same one processed sub-stream.

1        49. The receiver of claim 48, wherein the transmit feature  
2 comprises a bit rate.

1        50. The receiver of claim 48, wherein the transmit feature  
2 comprises a power level.

1        51. The receiver of claim 41, wherein the receiver is part of a base  
2 station of a wireless communication system.

1        52. The receiver of claim 41, wherein the receiver is part of a  
2 terminal.

1        53. The wireless communication system of claim 51, wherein the  
2 wireless communication system is a CDMA system.

1        54. The wireless communication system of claim 51, wherein the  
2 wireless communication system is a OFDM system.

1        55. A method for processing a received signal that includes at least  
2 a portion of at least one processed sub-stream, each processed sub-  
3 stream representing a respective one of a plurality of sub-streams, each  
4 sub-stream including a respective plurality of sub-stream-components,  
5 each processed sub-stream including a plurality of strata, each stratum of  
6 each processed sub-stream representing a respective one of the plurality  
7 of sub-stream-components of the particular sub-stream represented by  
8 that particular processed sub-stream, the method comprising the steps of:

9                (a) decoding at least a portion of one of the strata to obtain at least a  
10 portion of its respective sub-stream component; and

11                (b) decoding at least a portion of another of the strata to obtain at  
12 least a portion of its respective sub-stream component.

1        56. The method of claim 55, further comprising the step of  
2 repeating decoding step (b) until all of the sub-stream-components  
3 represented by the strata in the received signal are decoded.